

**THE TOTAL COSTS OF CLEANING UP
NONFEDERAL SUPERFUND SITES**

The Congress of the United States
Congressional Budget Office

NOTES

Numbers in the text and tables of this study may not add to totals because of rounding.

Except for references to legislation, all of the years referred to in this study are federal fiscal years.

Cover photo shows drums at an abandoned waste site in New Jersey that ranked high on Superfund's National Priorities List. (Photo by S.C. Delaney, Environmental Protection Agency.)

Preface

The federal Superfund program to clean up the nation's worst hazardous waste sites has been controversial since its creation in 1980. As the Congress begins to consider reauthorizing Superfund, which is due to expire on September 30, 1994, it is giving increased scrutiny to several aspects of the program, including the cost. This study, written at the request of the ranking Member of the House Committee on the Budget, analyzes the future costs to the public and private sectors that can be expected under Superfund's current policies. In keeping with the mandate of the Congressional Budget Office (CBO) to provide objective analysis, the study makes no recommendations.

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Christian Howlett Spoor edited the manuscript. Gwen Coleman and Donna Wood typed the tables. Kathryn Quattrone, with the assistance of Martina Wojak-Piotrow, prepared the study for publication.

Robert D. Reischauer
Director

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Summary

The cost of cleaning up the nation's hazardous waste sites is far greater than the Congress expected in 1980 when it passed the federal law governing such cleanup. The magnitude of remaining costs is an important issue as the Congress reviews the progress and prospects of the federal Superfund program, set to expire on October 1, 1994. This study seeks to inform the Congressional and public reauthorization debate by estimating Superfund's future costs under existing policies.

Unlike most federal environmental laws, which focus on reducing new emissions of hazardous substances, Superfund focuses on cleaning up sites that are already contaminated. The Environmental Protection Agency (EPA) has evaluated thousands of contamination problems and placed nearly 1,300 of the worst sites on the National Priorities List (NPL) for intensive cleanup. The differences in type and extent of contamination at NPL sites lead to a range of cleanup costs per site from the millions of dollars to the hundreds of millions. Under the Superfund law, certain "responsible parties" are liable for a site's costs; EPA can enforce this liability either by having the responsible parties perform the cleanup under its oversight or by conducting its own cleanup (with the government of the state in which the site is located paying a required share) and recovering the costs afterward.

Data gained from the first 12 years of Superfund's operation underpin the estimates reported in this study. Yet much remains uncertain--particularly the number of sites that will ultimately be identi-

fied as needing cleanup. Lesser sources of uncertainty in the estimates are the costs of evaluating and cleaning up each site and the public and private costs of administering the program, including the costs of establishing or contesting liability for cleanup. The Congressional Budget Office's (CBO's) analysis reflects these uncertainties by reporting estimates for three scenarios based on differing assumptions. None of the scenarios, however, incorporate major changes in policy or breakthroughs in cleanup technologies.

Estimates of Future Costs

CBO's base-case estimate is that Superfund cleanups will cost the public and private sectors about \$75 billion from fiscal year 1993 onward. This figure includes all Superfund-related expenditures except those associated with cleaning up federal facilities and is in discounted, present-worth dollars--a measure that is useful in summarizing costs incurred over many years because it takes into account the time value of money. (For comparison, the estimated present worth of spending obligations from the beginning of Superfund through 1992 is less than \$30 billion.) Estimated direct costs to the various payers, not including subsequent cost recoveries, are \$43 billion (58 percent) to responsible parties, \$28 billion (38 percent) to the federal government, and \$3 billion (4 percent) to the states for required contributions to cleanups conducted by EPA. State

and local governments that are liable at specific sites will also pay some share of the responsible-party costs.

The present-worth estimate of about \$75 billion assumes a real discount rate of 7 percent per year; the corresponding figure in real dollars (adjusted for inflation but not discounted) is roughly \$230 billion. These costs are incurred through the year 2070; hence, annual costs over the entire 78-year period average \$2.9 billion, which closely matches current combined public and private spending for Superfund. This simple average can be misleading, however, because some expenditures must precede others. Average costs before 2047, the year in which the last cleanup project is assumed to move into the operations and maintenance phase, are estimated to be \$4.2 billion per year. Moreover, assuming no constraints on funding, annual spending could rise over the next decade to a peak of \$9.1 billion in 2003.

Estimates other than the base-case figures were developed using alternative assumptions--the most important concerning the number of sites to be discovered and cleaned up. The base case assumes that EPA ultimately places 4,500 nonfederal sites on the NPL, a fourfold increase over the 1,149 such sites included by the end of 1992. This assumption comes from an extrapolation of the number of sites screened for the NPL so far and a rough estimate by EPA staff of the percentage of screening sites that may be placed on the NPL. Plausible variations in the assumptions about future screening sites and the placement rate lead to a total of 2,300 NPL sites in the low case and 7,800 sites in the high case. Total estimated costs in the low case are \$42 billion in present-worth terms, of which the federal government's share is \$17 billion. In the high case, the estimated total is \$120 billion, including \$43 billion spent by the federal government.

Site investigation and cleanup account for about 65 percent of future Superfund costs in all three scenarios. Costs for litigation, negotiation, and other activities associated with the liability system represent about 24 percent of the total. This share is consistent with CBO's analysis of expenditures through 1992, which does not support the common perception that most Superfund money has been

spent on attorneys' fees. The remaining 10 percent to 12 percent of estimated future costs reflect federal costs for management, support, and research.

How Does This Study Differ from Previous Analyses of Superfund Costs?

The Environmental Protection Agency and a group of researchers at the University of Tennessee have both published partial estimates of Superfund's future costs. The CBO estimates differ from these predecessors in four ways.

- o CBO's estimates are more comprehensive, including public and private administrative and legal costs and cleanup costs for sites not yet discovered.
- o CBO's analysis separates NPL sites into three cost groups. The Superfund experience to date shows that some sites are hundreds of times more expensive than others; the base-case estimate of the average cost for a small minority of "mega-sites" is \$169 million in cleanups conducted by EPA, compared with a \$24 million average for all other sites. Evidence suggests that relatively fewer mega-sites have been discovered since the early years of the program, which leads CBO to expect a downward trend in average cleanup costs as time passes.
- o The estimates consider the time path of Superfund expenditures in order to calculate their discounted present worth.
- o The analysis of cleanup costs incorporates recent EPA data on the differences between initial estimates and final costs. It also allows for the possibility that private-sector cleanups may cost less than those performed by the government.

The wider coverage and the use of discounted dollars in CBO's analysis yield very different costs than the EPA and Tennessee estimates of \$16 billion and \$151 billion, respectively. The EPA figure is restricted to costs incurred by the federal government

during cleanup of the first 1,236 NPL sites; the Tennessee figure gives past and future costs of cleaning up 3,000 nonfederal NPL sites in undiscounted dollars, omitting administrative and legal costs. In terms of average cleanup costs per site, the CBO estimates are lower than comparable EPA and Tennessee figures, primarily because of the assumptions about the future incidence of mega-sites and the costs saved in private-sector cleanups.

Implications for Federal Cleanup Policy

CBO's analysis of future Superfund costs has several important implications for the federal government's cleanup policy.

- o *Estimates of total Superfund costs depend strongly on the ultimate number of sites to be cleaned up--a number that remains highly uncertain.* The CBO scenarios assume that the total number of nonfederal NPL sites could be as low as 2,300 or as high as 7,800; largely as a result, present-worth costs vary by a factor of almost three between the low case and the high case. More extreme numbers of NPL sites are less likely than those assumed here, but they cannot be ruled out from the data now available.
- o *Under any plausible assumptions, Superfund expenditures are not even halfway complete; thus, the Congress may be justified in considering policy changes that involve short-term transition costs but long-term benefits.* CBO's analysis implies that the funds obligated through fiscal year 1992 represent between 19 percent and 40 percent of the economic value of Superfund's total costs, measured in present-worth dollars. In undiscounted dollars, these obligations constitute only an estimated 5 percent to 17 percent of the ultimate total.
- o *Required contributions by the states will remain a relatively small share of total costs, but they will rise dramatically from current levels.* The estimated state share of future costs is 4 percent

to 5 percent in present-worth terms (8 percent to 9 percent in undiscounted dollars). The observed share to date is much lower--less than 1 percent--because state contributions are concentrated at the end of the cleanup process. EPA data and studies indicate that these contributions totaled about \$0.1 billion through 1992, whereas the base-case estimate of future state costs is \$3.3 billion in present-worth terms, or \$19 billion in undiscounted dollars.

- o *Under CBO's base-case and high-case assumptions, but not its low-case assumptions, EPA will need large increases in funding to avoid a growing backlog of sites awaiting study and cleanup.* The base case assumes that roughly 900 sites--14 percent of those in the final, "decision-pending" stage of EPA's screening process--were awaiting placement on the NPL at the end of 1992. Adding these sites to the list over a 10-year period while expeditiously cleaning up current NPL sites and processing new sites brought to EPA's attention would require federal Superfund spending to double by the year 2003. (Total public and private spending would triple.) Keeping pace with the site work load in the high case would require federal spending to triple (and total spending to increase almost fivefold).

When the current Superfund law was enacted, little information was available about the ultimate costs to the taxpayer and the economy. Now that the general order of magnitude of public and private Superfund obligations is becoming clearer, the program's balance of benefits and costs may warrant a second look.

The estimates described in this study do not evaluate policy alternatives that might be less costly than current law, but they do provide a baseline against which alternatives could be evaluated. Alternatives that have been discussed include narrowing the range of sites handled by the federal program, revising cleanup standards, reordering priorities among sites or within sites, giving local communities more say in decisions about cleanup, narrowing or eliminating the law's liability provisions, and encouraging or requiring EPA to make greater use of settlement tools available in the current law.

